

**WHAT IS CLAIMED IS:**

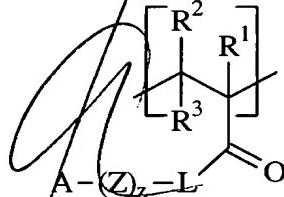
A suds-forming and/or foam-forming composition having increased suds volume and suds retention, said composition comprising:

- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
  - i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
- b) an effective amount of a detergents surfactant; and
- c) the balance carriers and other adjunct ingredients;  
provided that a 10% aqueous solution of said suds-forming and/or foam-forming composition has a pH of from about 4 to about 12.

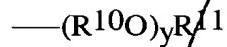
- 2. A composition according to Claim 1 wherein said polymeric suds stabilizer
  - (a) further comprises:
    - ii) units capable of having an anionic charge at a pH of from about 4 to about 12;
    - iii) units capable of having an anionic charge and a cationic charge at a pH of from about 4 to about 12;
    - iv) units having no charge at a pH of from about 4 to about 12; and
    - v) mixtures of units (i), (ii), (iii), and (iv).
- 3. A composition according to Claim 2 wherein said polymeric suds stabilizer has an average molecular weight of from about 1,000 to about 2,000,000 daltons.
- 4. A composition according to Claim 1 wherein the detergents surfactant (b) is selected from the group consisting of linear alkyl benzene sulfonates, a-olefin sulfonates, paraffin sulfonates, methyl ester sulfonates, alkyl sulfates, alkyl alkoxy sulfates, alkyl sulfonates, alkyl alkoxy carboxylates, alkyl alkoxy sulfates, sarcosinates, taurinates, and mixtures thereof.
- 5. A composition according to Claim 1, wherein said other adjuncts ingredients (c) is selected from the group consisting of : soil release polymers, polymeric dispersants,

polysaccharides, abrasives, bactericides, tarnish inhibitors, builders, enzymes, opacifiers, dyes, perfumes, thickeners, antioxidants, processing aids, suds boosters, buffers, antifungal or mildew control agents, insect repellants, anti-corrosive aids, and chelants.

6. A composition according to Claim 1, wherein said deterotive surfactant (b) is selected from the group consisting of amine oxides, polyhydroxy fatty acid amides, betaines, sulfobetaines, alkyl polyglycosides, alkyl ethoxylates, and mixtures thereof.
7. A composition according to Claim 1, wherein said polymeric suds stabilizer (a) is a proteinaceous suds stabilizer.
8. A composition according to Claim 1, further comprising an enzyme selected from the group consisting of protease, amylase, and mixtures thereof.
9. A composition according to Claim 1, wherein said polymeric suds stabilizer (a) is a polymer comprising at least one monomeric unit of the formula:



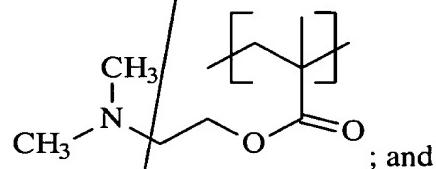
wherein each of R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, and mixtures thereof; L is selected from the group consisting of a bond, O, NR<sup>6</sup>, SR<sup>7</sup>R<sup>8</sup> and mixtures thereof, wherein R<sup>6</sup> is selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>8</sub> alkyl and mixtures thereof; each of R<sup>7</sup> and R<sup>8</sup> are independently hydrogen, O, C<sub>1</sub> to C<sub>8</sub> alkyl and mixtures thereof, or SR<sup>7</sup>R<sup>8</sup> form a heterocyclic ring containing from 4 to 7 carbon atoms, optionally containing additional hetero atoms and optionally substituted; Z is selected from the group consisting of: -(CH<sub>2</sub>)-, (CH<sub>2</sub>-CH=CH)-, -(CH<sub>2</sub>-CHOH)-, (CH<sub>2</sub>-CHNR<sup>6</sup>)-, -CH<sub>2</sub>-CHR<sup>14</sup>-O- and mixtures thereof; wherein R<sup>14</sup> is selected from the group consisting of hydrogen, C<sub>1</sub> to C<sub>6</sub> alkyl, and mixtures thereof; z is an integer selected from about 0 to about 12; A is NR<sup>4</sup>R<sup>5</sup>, wherein each of R<sup>4</sup> and R<sup>5</sup> are independently selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>8</sub> linear or branched alkyl, alkyleneoxy having the formula:



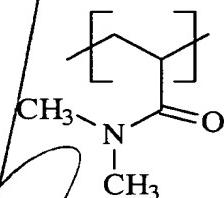
wherein R<sup>10</sup> is C<sub>2</sub>-C<sub>4</sub> linear or branched alkylene, and mixtures thereof; R<sup>11</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, and mixtures thereof; y is from 1 to about 10; or NR<sup>4</sup>R<sup>5</sup> form a heterocyclic ring containing from 4 to 7 carbon atoms, optionally containing additional hetero atoms, optionally fused to a benzene ring, and optionally substituted by C<sub>1</sub> to C<sub>8</sub> hydrocarbyl; and wherein said polymeric suds stabilizer has a molecular weight of from about 1,000 to about 2,000,000 daltons.

10. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a copolymer of:

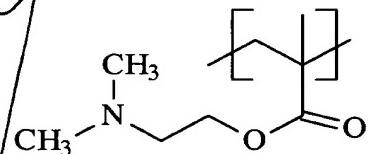
i)



ii)

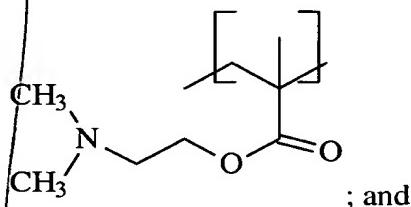


11. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a homopolymer of:

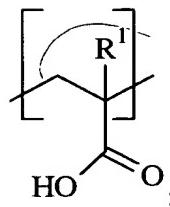


12. A composition according to Claim 9, wherein said polymeric suds stabilizer (a) is a copolymer of:

i)

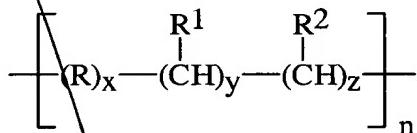


ii)



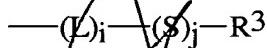
wherein R<sup>1</sup> is either hydrogen or methyl.

13. A composition according to Claim 1, wherein said polymeric suds stabilizer (a) is a zwitterionic polymeric suds stabilizer of the formula:

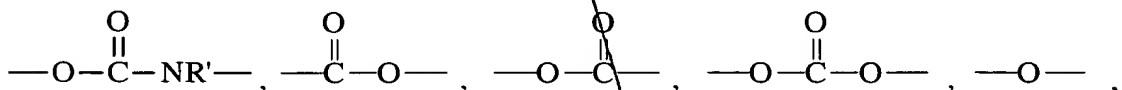


wherein R is C<sub>1</sub>-C<sub>12</sub> linear alkylene, C<sub>1</sub>-C<sub>12</sub> branched alkylene, and mixtures thereof; R<sup>1</sup> is a unit capable of having a negative charge at a pH of from about 4 to about 12; R<sup>2</sup> is a unit capable of having a positive charge at a pH of from about 4 to about 12; n has a value such that said zwitterionic polymers suds stabilizer has an average molecular weight of from about 1,000 to about 2,000,000 daltons; x is from 0 to 6; y is 0 or 1; and z is 0 or 1.

14. A composition according to Claim 13 wherein R<sup>1</sup> has the formula:



wherein L is a linking unit independently selected from the following:



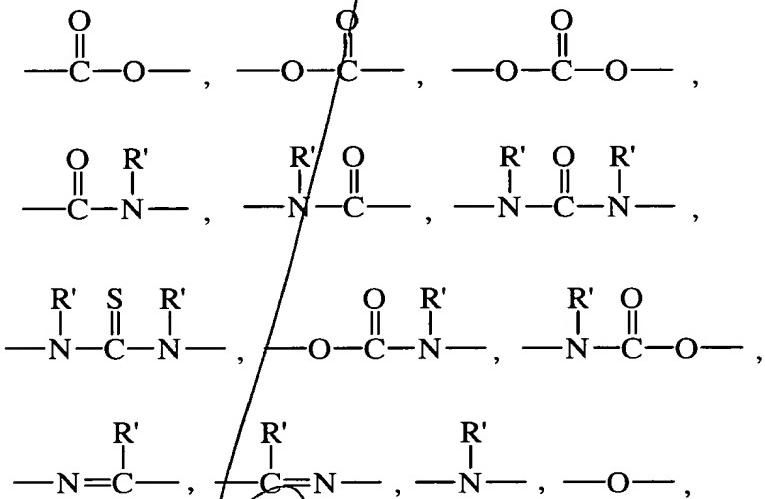
and mixtures thereof; R' is independently hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, and mixtures thereof or R' and S can form a heterocycle of 4 to 7 carbon atoms, optionally containing other hetero atoms and optionally substituted; R<sup>3</sup> is independently selected from -CO<sub>2</sub>M, -SO<sub>3</sub>M, -OSO<sub>3</sub>M, -CH<sub>2</sub>P(O)(OM)<sub>2</sub>, -OP(O)(OM)<sub>2</sub>, units having the formula:

—CR<sup>8</sup>R<sup>9</sup>R<sup>10</sup>

wherein each R<sup>8</sup>, R<sup>9</sup>, and R<sup>10</sup> is independently selected from the group consisting of hydrogen, -(CH<sub>2</sub>)<sub>m</sub>R<sup>11</sup>, and mixtures thereof, wherein R<sup>11</sup> is -CO<sub>2</sub>H, -SO<sub>3</sub>M, -OSO<sub>3</sub>M, -CH(CO<sub>2</sub>H)CH<sub>2</sub>CO<sub>2</sub>H, -CH<sub>2</sub>P(O)(OH)<sub>2</sub>, -OP(O)(OH)<sub>2</sub>, and mixtures thereof; provided that one R<sup>8</sup>, R<sup>9</sup>, or R<sup>10</sup> is not a hydrogen atom; R<sup>2</sup> has the formula:

—(L<sup>1</sup>)<sub>i'</sub>—(S)<sub>j'</sub>—R<sup>4</sup>

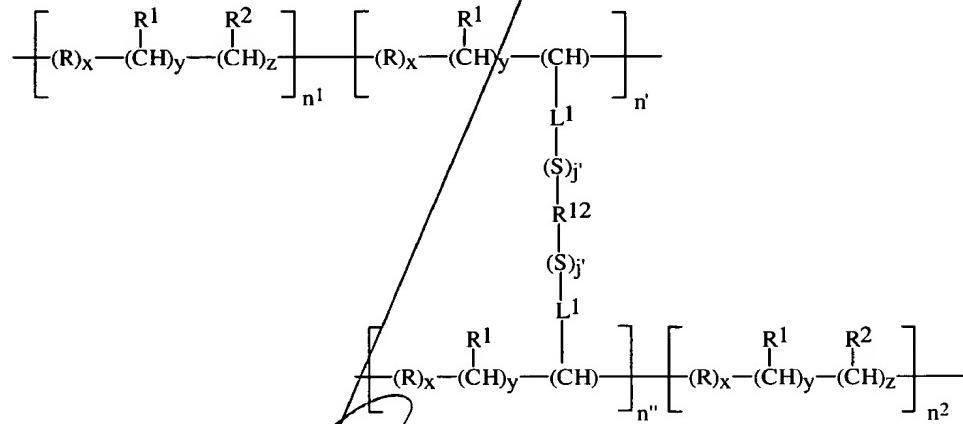
wherein L<sup>1</sup> is a linking unit independently selected from the following:



and mixtures thereof; wherein R' is independently hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, and mixtures thereof or alternatively R' and S can form a heterocycle of 4 to 7 carbon atoms, optionally containing other hetero atoms and optionally substituted; R<sup>4</sup> is independently selected from amino, alkylamino carboxamide, 3-imidazolyl, 4-imidazolyl, 2-imidazolinyl, 4-imidazolinyl, 2-piperidinyl, 3-piperidinyl, 4-piperidinyl, 1-pyrazolyl, 3-pyrazoyl, 4-pyrazoyl, 5-pyrazoyl, 1-pyrazolinyl, 3-pyrazolinyl, 4-pyrazolinyl, 5-pyrazolinyl, 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, piperazinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, guanidino, amidino, and mixtures thereof; each S is independently selected from C<sub>1</sub>-C<sub>12</sub> linear alkylene, C<sub>1</sub>-C<sub>12</sub> branched alkylene, C<sub>3</sub>-C<sub>12</sub> linear alkenylene, C<sub>3</sub>-C<sub>12</sub> branched alkenylene, C<sub>3</sub>-C<sub>12</sub> hydroxyalkylene, C<sub>4</sub>-C<sub>12</sub> dihydroxyalkylene, C<sub>6</sub>-C<sub>10</sub> arylene, C<sub>8</sub>-C<sub>12</sub> dialkylarylene, -(R<sup>5</sup>O)<sub>k</sub>R<sup>5</sup>-, -(R<sup>5</sup>O)<sub>k</sub>R<sup>6</sup>(OR<sup>5</sup>)<sub>k</sub>-, -CH<sub>2</sub>CH(OR<sup>7</sup>)CH<sub>2</sub>-, and mixtures thereof; R<sup>5</sup> is C<sub>2</sub>-C<sub>4</sub> linear alkylene, C<sub>3</sub>-C<sub>4</sub> branched alkylene, and mixtures thereof; R<sup>6</sup> is C<sub>2</sub>-C<sub>12</sub> linear alkylene, and mixtures thereof; R<sup>7</sup> is

hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, and mixtures thereof; M is hydrogen or a water soluble cation; i is 0 or 1; i' is 0 or 1; j is 0 or 1; j' is 0 or 1; k is from 1 to 20; and m is from 0 to 10.

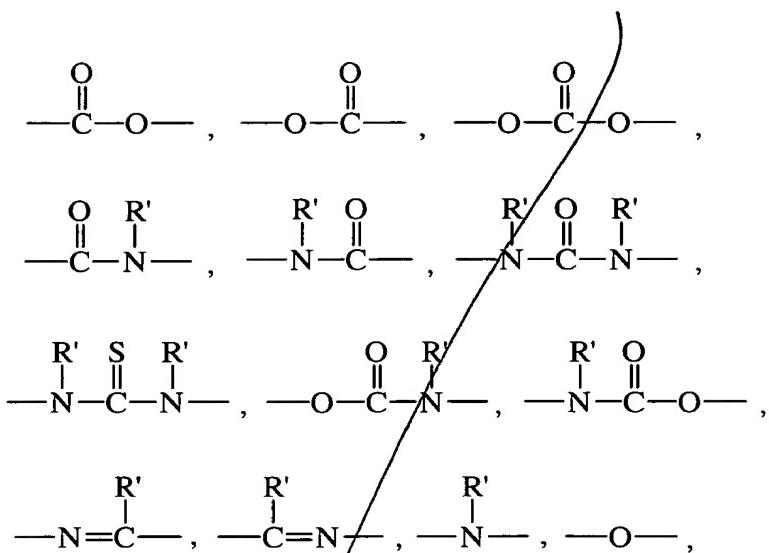
15. A composition according to Claim 1 wherein said polymeric suds stabilizer (a) is a zwitterionic polymeric suds stabilizer of the formula:



wherein R is C<sub>1</sub>-C<sub>12</sub> linear alkylene, C<sub>1</sub>-C<sub>12</sub> branched alkylene, and mixtures thereof; R<sup>1</sup> is a unit capable of having a negative charge at a pH of from about 4 to about 12; R<sup>2</sup> is a unit capable of having a positive charge at a pH of from about 4 to about 12; C<sub>1</sub>-C<sub>12</sub> linear alkylene amino alkylene having the formula:



L<sup>1</sup>, and mixtures thereof, wherein each R<sup>13</sup> is independently L<sup>1</sup>, ethylene, and mixtures thereof; each S is independently selected from C<sub>1</sub>-C<sub>12</sub> linear alkylene, C<sub>1</sub>-C<sub>12</sub> branched alkylene, C<sub>3</sub>-C<sub>12</sub> linear alkenylene, C<sub>3</sub>-C<sub>12</sub> branched alkenylene, C<sub>3</sub>-C<sub>12</sub> hydroxyalkylene, C<sub>4</sub>-C<sub>12</sub> dihydroxyalkylene, C<sub>6</sub>-C<sub>10</sub> arylene, C<sub>8</sub>-C<sub>12</sub> dialkylarylene, -(R<sup>5</sup>O)<sub>k</sub>R<sup>5</sup>-, -(R<sup>5</sup>O)<sub>k</sub>R<sup>6</sup>(OR<sup>5</sup>)<sub>k</sub>-, -CH<sub>2</sub>CH(OR<sup>7</sup>)CH<sub>2</sub>-, and mixtures thereof; L<sup>1</sup> is a linking unit independently selected from the following:



and mixtures thereof;  $n^1 + n^2$  has a value such that said zwitterionic polymers suds stabilizer has an average molecular weight of from about 1,000 to about 2,000,000 daltons;  $n'$  is equal to  $n''$  and further  $n' + n''$  is less than or equal to 5% or the value  $n^1 + n^2$ ;  $x$  is 0 to 6;  $y$  is 0 or 1; and  $z$  is 0 or 1.

16. The composition according to Claim 1 wherein the composition is a personal care composition.
17. The composition according to Claim 1 wherein the composition is a laundry detergent composition.
18. The composition according to Claim 1 wherein the composition is a hard surface cleaning composition.
19. The composition according to Claim 1 wherein the composition is an agrochemical foaming composition.
20. The composition according to Claim 1 wherein the composition is an oil-field foaming composition.
21. The composition according to Claim 1 wherein the composition is a fire-fighting foaming composition.
22. A method for providing extended suds and/or foam volume and suds and/or foam duration when washing parts of a person's body in need of cleaning, comprising

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- the step of contacting said parts with an aqueous solution of a personal care composition, said personal care composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
    - i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
  - b) an effective amount of a detergents surfactant; and
  - c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said personal care composition is from about 4 to about 12.
23. A method for providing increased suds volume and increased suds retention while washing a fabric and/or garment in need of cleaning, comprising the step of contacting said fabric and/or garment with an aqueous solution of a laundry detergent composition, said laundry detergent composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
    - i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
  - b) an effective amount of a detergents surfactant; and
  - c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said laundry detergent composition is from about 4 to about 12.
24. A method for providing increased suds volume and increased suds retention while cleaning a hard surface in need of cleaning in need of cleaning, comprising the step of contacting said hard surface with an aqueous solution of a hard surface cleaning composition, said hard surface cleaning composition comprising:

- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
- i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
- b) an effective amount of a detergents surfactant; and
- c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said hard surface cleaning composition is from about 4 to about 12.
25. A method for providing increased suds volume and increased suds retention while treating a plant and/or crop in need of treatment, comprising the step of contacting said plant and/or crop with an aqueous solution of a agrochemical foaming composition, said agrochemical foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
- i) units capable of having a cationic charge at a pH of from about 4 to about 12,  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
- b) an effective amount of a detergents surfactant; and
- c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said agrochemical foaming composition is from about 4 to about 12.
26. A method for providing increased suds volume and increased suds retention while drilling for oil in oil-fields, comprising the step of contacting said drilling equipment and/or subterranean formations with an aqueous solution of a oil-field foaming composition, said oil-field foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:

- i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
- b) an effective amount of a clay; and
- c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said oil-field foaming composition is from about 4 to about 12.
27. A method for providing increased suds volume and increased suds retention while fighting a fire, comprising the step of contacting said fire with an aqueous solution of a fire-fighting foaming composition, said fire-fighting foaming composition comprising:
- a) an effective amount of a polymeric suds stabilizer, said stabilizer comprising:
- i) units capable of having a cationic charge at a pH of from about 4 to about 12;  
provided that said suds stabilizer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12;
- b) an effective amount of a detergents surfactant; and
- c) the balance carriers and other adjunct ingredients;  
provided that the pH of a 10% aqueous solution of said fire-fighting foaming composition is from about 4 to about 12.